REMARKS

Claims 1-6, 8 and 9 are currently pending. Claim 7 has been canceled as being inconsistent with amended claim 1 and claims 8 and 9 have been added to round out the scope of protection being sought.

The Office Action of September 4, 2003 includes a rejection of claims 1 and 3 under 35 U.S.C. §102(b) as allegedly being clearly anticipated by the *Yagi et al.* patent publication (JP 06230295). This rejection has been rendered moot by the amendments to claim 1.

The Office Action also includes a rejection of claims 2, 4 and 7 under 35 U.S.C. §103 as allegedly being unpatentable over the *Yagi et al.* patent publication in view of the *Wood et al.* patent (U.S. Patent 6,396,975). This rejection is traversed insofar as it applies to amended claim 1 and the claims dependent therefrom.

With respect to the amendments to claim 1, it should be noted that several recitations from claim 2 have been added to claim 1, and additional recitations have also been added, the effect of which on patentability is described below.

The *Yagi* Patent Publication

The *Yagi* patent publication discloses a substrate 1 as provided with a V-shaped groove 10 fixed electrodes 14 and 15 are provided in the V-shaped groove and on the flat surface of the substrate at positions straddling a pivot point 2 of a mirror 11 of a machine movable part 11. On a surface of the machine movable part 11 is a mirror surface 11a. Presumably upon the selective application of voltage to the fixed electrodes 14 and 15 and

conductive thin film which forms the movable machinable part 11, the mirror surface 11a of the machine movable part 11 is drawn into the groove below the surface of the device or onto the electrode 15 and above the surface of the device. As illustrated in Figure 4, light impinges upon the surface of the machine movable part from above the device and is selectively deflected depending on the position of the mirror whether pulled below the surface or drawn above the surface by the selective application of voltage to the fixed electrodes 14 and 15, respectively.

It is respectfully submitted that claim 1, as amended, defines a different device. Specifically, claim 1 recites a micro-mirror actuator which includes a substrate and posts formed to a predetermined height on the substrate in space to predetermine distance apart. The torsion bar is fixed to the posts and the mirrors coupled to the torsion bar. A groove including an inclined contact surface is formed in the substrate and the inclined contact surface contacts a lower bottom surface of the mirror when the mirror is rotated. What is clearly not shown in the *Yagi et al.* patent publication is Claim 1's magnet for generating forces to drive the mirror taking advantage of an external magnetic field. The magnet as recited in claim 1 is formed at one end of the mirror relative to the torsion bar corresponding to the inclined surface. A reflective surface on the other end of the mirror is positioned such that when the mirror contacts the inclined contact surface of the one end, the reflective surface reflects light traveling parallel to a plane of the substrate at the other end.

Hence, unlike the *Yagi et al.* patent publication, the present invention uses a magnet and an external magnetic field to drive the mirror.

The *Wood et al.* Patent

The *Wood et al.* patent was applied for the concept of constructing the light deflector of the *Yagi et al.* patent publication with an actuator to have a magnetic driving means. The *Wood* patent, and relative in part, for instance, at column 8, lines 45 *et seq.* describes the use of a magnetic field created between a first and second micro-electro substrate to magnetically activate a pop-up mirror. In this instance, however, the embodiment using magnetic field actuation is described as having a frame which "may serve as the magnetically active component of the pop-up mirror." See column 8, lines 59 and 60. In marked contrast to this embodiment, the present invention places the magnet on a portion of the mirror that is not intended to receive light, i.e., the magnet is formed on one end of the mirror relative to the torsion bar corresponding to the incline contact surface and the reflective surface on the other end of the mirror is positioned so that when the mirror contacts the incline contact surface at the one end, the reflective surface reflects light traveling parallel to the plane of the substrate at the other end. An advantage of this structure is that the reflective surface is not diminished by the presence of a mirror but instead the entire surface can potentially be reflective thus maximizing the amount of reflected light.

Claim 2

Claim 2 is separately patentable from claim 1 insofar as it recites a clamping electrode for generating electrostatic forces to clamp the mirror, the clamping electrode formed on the incline contact surface of the groove. An advantage to this structure is, for

instance, when an external magnetic field is applied, the magnet generates forces to drive the mirror to a inclined position the mirror could then be clamped to the inclined contact surface of the groove by the use of electrostatic forces. The undersigned's review of the applied art, including Applicants' description of prior art, it is not disclosed. This unique combination of uses of both magnetic and electrostatic forces where one is used to actuate and the other is used to clamp. Hence, Applicants respectfully submit that claim 2 is separately patentable for at least this reason.

Claims 5 and 6

The Office Action includes a rejection of claim 5 under 35 U.S.C. §103 as allegedly being unpatentable over the *Yagi et al.* patent publication in view of the *Wood et al.* patent, and in further view of Applicants' description of prior art. Similarly, the Office Action includes the rejection of claim 6 under 35 U.S.C. §103 as allegedly being unpatentable over the *Yagi et al.* patent publication in view of Applicants' description of prior art. These rejections are respectfully traversed.

In each instance, claims 5 and 6 recite that the plurality of mirrors are arranged on the end of the mirror corresponding to the inclined contact surface. In marked contrast, the mirrors shown in prior art Figures 1-4 are not in a position of an inclined contact surface, and in fact, are not involved in an embodiment having an inclined contact surface. However, if one were to assume for arguments sake that placing a plurality of magnets on the *Yagi* device were appropriate, which seems unlikely given that the *Yagi et al.* patent publication uses an electrostatic drive, the clear inference would be to place the magnets on

either side of a reflective surface that is rotated above the surface of the substrate to intercept the light. The *Wood et al.* patent does not teach anything contrary, and in fact, teaches that the magnetic material should be used as a frame. However one views the collective teachings, they would not teach a plurality of magnets arranged on the end of the mirror corresponding to an inclined contact surface.

In light of the foregoing, Applicants respectfully request reconsideration and allowance of the above-captioned application. Should any residual issues exist, the Examiner is invited to contact the undersigned at the number listed below.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

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By: _____
Charles F. Wieland III
Registration No. 33,096

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620